

Cotton Insulation

Having a well-insulated building envelope is crucial to creating an environmentally sound building. By minimizing heat transfer through the envelope, energy used to maintain the interior climate is similarly minimized, reducing both utility bills and the environmental costs of fossil fuel use.

Fiberglass is the most common material used for wall and ceiling insulation. Cotton insulation comes in batts that are comparable to fiberglass in ease of installation, fire resistance, and energy efficiency. However, it has better sound-dampening qualities and avoids some of the potential health problems of fiberglass.



PRODUCT COMPARISONS

Cotton Insulation

High Recycled Content
Safe to Handle and Install
Minimal Energy Used to Manufacture
Class I Fire Rating
No Formaldehyde-based Binders
Superior Acoustical Properties

Conventional Insulation

Lower Recycled Content
Potentially Harmful to Installer
Somewhat Energy Intensive to Manufacture
Class I Fire Rating
Formaldehyde-based Binders
Inferior Acoustical Properties

LEED CREDITS

Using this material potentially contributes to obtaining these credits in the US Green Building Council's LEED certification program:

Energy & Atmosphere

EA Prerequisite 2 Minimum Energy Performance

EA Credit 1 Optimize Energy Performance

Materials & Resources

MR Credit 4.1 Recycled Content

MR Credit 4.2 Recycled Content

MR Credit 6 Rapidly Renewable Materials (cotton, a plant, is considered a rapidly renewable product)



LEED stands for Leadership in Energy and Environmental Design. To find out more about it, visit www.leadbuilding.org.

ENVIRONMENTAL ATTRIBUTES

Energy Performance

Cotton insulation has thermal properties similar to those of fiberglass, with R-values ranging from about 3.2-3.7 per inch. However, this R-value is idealized, as effective insulation capabilities for all types of batts can be significantly lower due to typically deficient installation. Also, batts are not as effective at sealing air leaks as spray or blown-in insulation, further reducing actual energy performance of the building envelope.

Resource Impacts

Because it can be harvested annually, cotton is considered a rapidly renewable resource, which has environmental advantages over finite raw material and long-cycle renewable resource extraction. However, it should be noted that current cotton growing practices are very pesticide intensive—more than most other crops. Cotton insulation is made from post-industrial, pre-consumer scraps from the garment industry, so it is not directly associated with those agricultural practices. At the end of its useful life, cotton insulation can, in theory, be recycled or composted.

Health Considerations

Unlike most fiberglass batts, cotton batts do not have a formaldehyde-based binder that can be harmful to installers and offgas once installed. Instead, melted polyolefin fibers bind the cotton fibers together, composing 5% of the finished product. Fiberglass fibers are friable and can easily become airborne, particularly during installation. These fibers can be inhaled, and some health experts claim that this particulate matter is carcinogenic. Cotton and polyolefin fibers are not believed to present these problems. For fire and pest resistance, the cotton fibers are treated with boric acid, the same low-toxicity and biodegradable flame retardant and insect/rodent repellent used in cellulose insulation and infant clothing.

Cotton insulation can absorb more moisture than most other types of insulation. If wall cavities are prone to wetting or are not allowed to dry out after wetting, there could be potential for mildew growth. Ensure a well-designed and constructed wall system.

FUNCTIONAL CONSIDERATIONS

Cost

Cotton insulation generally costs about twice as much as fiberglass batts. However, insulation material costs are generally a very small percentage of the total cost of construction. In addition, the excellent sound and safety qualities of cotton insulation make it a superior, incomparable product to fiberglass. Since insulation should be a one-time installation, ensuring quality workmanship and material is important as remedying substandard work later will be costly.

Installation

Cotton insulation comes in batt form, is easy to work with, soft, and not harmful to the installer or occupants. Cotton is more easily torn than cut. In order to maximize its energy performance,



ensure the insulation is properly fitted to completely fill the wall and ceiling cavities without being compressed by pipes or wires.

Cotton insulation can hold up to 15% moisture, which should not be problematic in walls assemblies that are dry or are able dry out between cycles of water loading. Repeated wetting and drying could, however, cause the borate treatment to leach out and mold to grow.

Maintenance

Any insulation type will have problems if excessive moisture is allowed into the wall cavity. If moisture is entering the wall cavity, the highest building priority should be to eliminate this problem before even considering the insulation. If the wall cavities are kept dry, there should be no need for maintenance.

Other Data/Comments

Check with your local building code and or local utility for recommended insulation levels. The Home Energy Saver can be a useful tool in assessing energy efficiency priorities for your house. It is an excellent on-line calculator developed by Lawrence Berkeley National Laboratory that takes data input by users and reports the measures that will likely be most effective in lowering utility bills and reducing your home's environmental impact. Use it at <http://hes.lbl.gov/>.

RESOURCES

For up-to-date product and retailer information, visit the manufacturers' websites or search the Green Materials Database, www.builditgreen.org/guide.

Manufacturers

Bonded Logic, Inc.
411 East Ray Road
Chandler, AZ
(480) 812-9114
www.bondedlogic.com

Inno-Therm
1633 Shea Road
Newton, NC 28658
(877) 466-0612
www.innotherm.com

Suppliers

Golden State Lumber
38801 Cherry Street
Newark, CA 94560
(510) 818-1000
www.goldenstatelumber.com

Hayward Lumber
429 Front Street
Salinas, CA 93901
(831) 755-8800
www.haywardlumber.com

Golden State Lumber
1100 Anderson Drive
San Rafael, CA 94901
(415) 454-2532
www.goldenstatelumber.com

Truitt & White Lumber (ACE)
642 Hearst Ave.
Berkeley, CA 94710
(510) 841-0511
www.truittandwhite.com

Golden State Lumber



3033 South Airport
Stockton, CA 95206
(209) 234-7700
www.goldenstatelumber.com

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